TETRA TECH EM INC. (TtEMI) REGION 5 START
SITE-SPECIFIC SAMPLING AND ANALYSIS PLAN
SHORT FORM

Project Information

TDD No.: S05-0411-009	TDD Type: Removal Site Evaluation	Analytical TDD No.: S05-0411-010
Site Name: Illinois Terminal Railroad	City/County: St. Clair County	State: IL
START Project Mgr: Tom Binz	U.S. EPA Project Mgr.: Mike Harris	

Site Lead: **X** U.S. EPA ☐ State ☐ PRP:_____ ☐ Other: _____

Site Description: The site is located adjacent to the former Illinois Terminal Railroad and the St. Louis Shredding AOC site. The site area is approximately 185 feet long and 35 feet wide. Previous sampling events at the St. Louis Shredding AOC site have indicated the presence of volatile organic compounds (VOC), metals, and polychlorinated biphenyls (PCB).

Sampling Information

Sampling Summary: START will use a "Triad Approach" to collect field screening data to help guide sample collection by using XRF and Chlor-N-Soil test kits. START will use the XRF to field screen the surface soil for high metals concentrations and the Chlor-N-Soil test kits to field screen for chlorinated organics. START will collect surface soil samples from the areas that the XRF and/or Chlor-N-Soil kits have shown to have elevated concentrations and submit them to a CLP laboratory for analysis. Grab samples will be collected using gloved hands and will be placed in appropriate glass jars. Composite samples will be collected with stainless steel spoon or trowel with gloved hands and homogenized in a disposable aluminum pie tin an placed in appropriate glass jars.

Date of Sampling Event: To be determined — Sample Shipment Date: To be determined

Data Deadline: Verbal: To be determined — Hardcopy: To be determined

Weather Conditions: Temperature, sky condition, and wind speed and direction will be recorded in a field logbook.

Type of Sampling: ☐ Site Characterization ☐ Disposal Characterization **X** Extent of Contamination
☐ Split-Samples ☐ Confirmation ☐ Other:_____

Laboratory: ☐ Field Tests: ☐ CRL:
X CLP: _____ ☐ Subcontracted:

Required Detection Limits: ☐ Method Quantitation Limits **X** State Cleanup Values ☐ U.S. EPA PRG Values
☐ Drinking Water ☐ Other:

Supporting Information

Table 1 lists the analytical parameters and methods, sample volumes and container types, and the numbers and types of investigative and quality control samples to be collected. Table 2 provides additional information about sample preservation requirements and holding times. Figure 1 shows approximate sampling locations. Attachment A includes copies of standard operating procedures (SOP) that will be used for this project.

Approvals

Signatures	Date
U.S. EPA Project Manager:	
START Project Manager:	
TtEMI QC Reviewer:	

TABLE 1

SAMPLING REQUIREMENTS WORKSHEET

Matrix	Parameter and Method[a]	Volume and Container[b]	Number of Investigative Samples	Number of Quality Control (QC) Samples[c]						Total Number of Investigative and QC Samples	Total Number of Sample Containers
				Matrix Spike (MS)	Matrix Spike Duplicate (MSD)	Field Duplicate or Split	Equipment Blank	Field Blank	Trip Blank		
Soil	Total RCRA metals SW-846 6010B, 6020, and/or 7000 series	One 8-ounce glass jar with Teflon®-lined cap	10-20	1	1	1-2	0	0	0	13-24	13-24
Soil	VOC SW-846 5035 and 8260B	One 25-gram Encore and two 5-gram Encores	10-20	1	1	1-2	0	0	0	13-24	39-72
Soil	PCB SW-846 8020	One 4-ounce glass jar with Teflon®-lined cap	10-20	1	1	1-2	0	0	0	13-24	13-24

Notes:

PCB = Polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
VOC = Volatile Organic Compound

a Matrix includes soil, sediment, solid waste, liquid waste other than oil, oil, groundwater, or surface water.
b Refer to Table 2 for required sample volumes, containers, preservation techniques, and holding times.
c Refer to Section 2.5.1 (Field Quality Control Requirements) of the TtEMI START Region 5 QAPP for typical QC sample types and frequencies.

TABLE 2

SW-846 SAMPLE VOLUMES, CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES

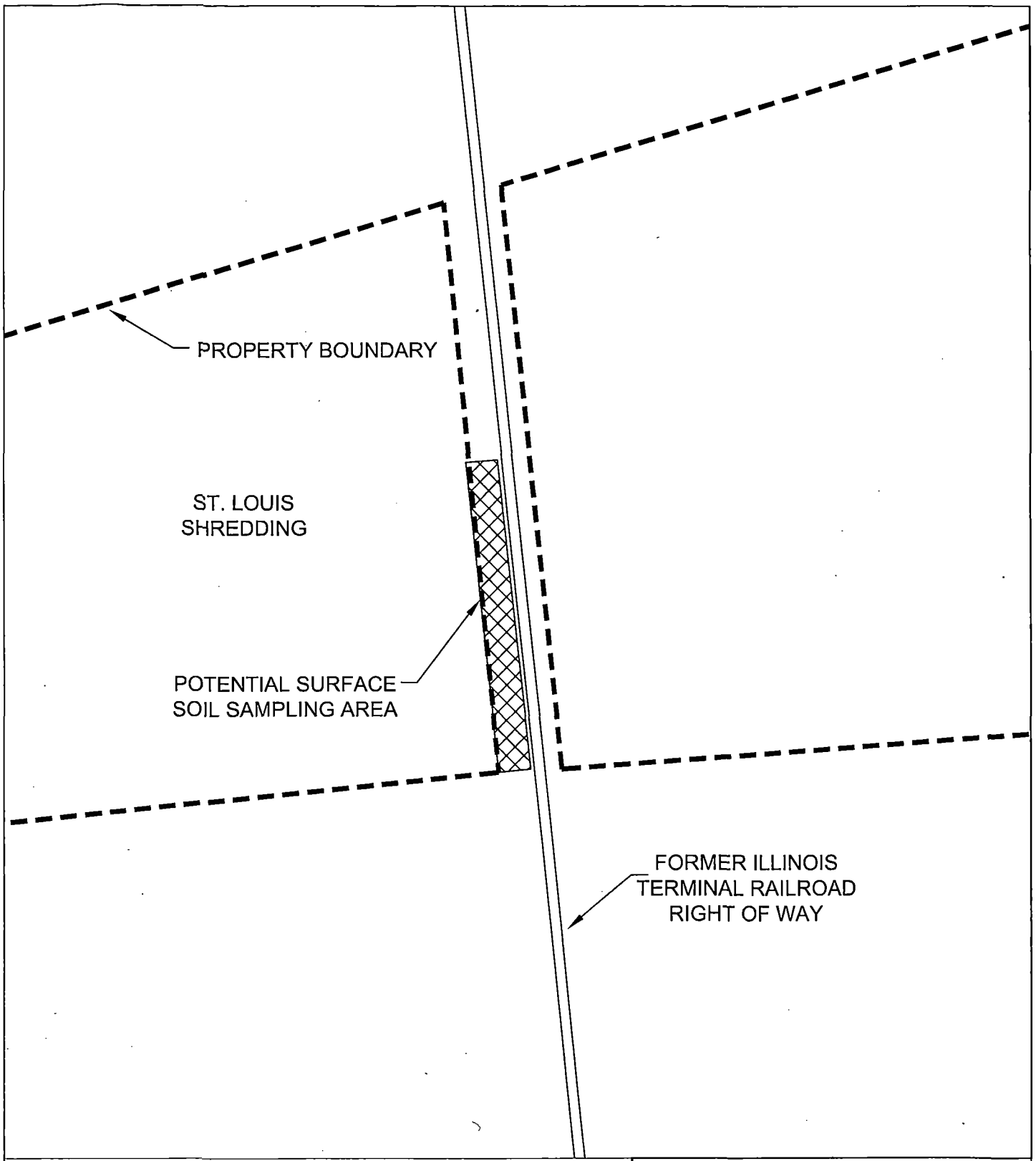
Matrix	Parameter	SW-846 Analysis	Volume and Container	Preservation Techniques	Holding Time[a] (Extraction/Analysis)
Solid	VOCs	5035 and 8260B[c]	(1) 5 grams of soil in 40-mL screw-top septum-sealed glass vial (2) 5 grams of soil in 40-mL screw-top septum-sealed glass vial (3) 5 grams of soil in EnCore™ sampler	(1) sodium bisulfate solution to pH ≤ 2; store at 4 °C (2) 10 mL of methanol; store at 4 °C (3) Store at 4 °C with no headspace and preserve with methanol within 48 hours	[b] NA/14 days
Solid	PCBs	8082	One 8-ounce glass jar with Teflon®-lined cap	Store at 4 °C	14 days/40 days
Solid	Metals (except mercury)	6010B, 6020, and/or 7000 series	One 8-ounce glass or polyethylene jar	Store at 4 °C	[b] NA/180 days

Notes:

[a] Holding time is measured from the time of sample collection to the time of sample extraction and analysis.

[b] NA = Not applicable.

[c] Method 5035 includes three different sample collection and preservation options: (1) low concentration samples collected with a preservative; (2) high concentration samples collected with a preservative; and (3) high concentration samples collected without a preservative.



LEGEND

- PROPERTY BOUNDARY
- RIGHT OF WAY
- POTENTIAL SURFACE SOIL SAMPLING AREA

ILLINOIS TERMINAL RAILROAD
TDD S05-0411-009

FIGURE 1
POTENTIAL SURFACE SOIL SAMPLING LOCATION AREA

Tetra Tech EM Inc.

ATTACHMENT A

TETRA TECH ENVIRONMENTAL
STANDARD OPERATING PROCEDURES (SOP)

SOP No.	Title
001	Site Reconnaissance and Characterization
003	Organic Vapor Air Monitoring
005	Soil Sampling
019	Packaging and Shipping Samples
024	Recording Notes in Field Logbooks
025	Soil Sampling for Volatile Organic Compounds (In Preparation)

SUPPLEMENTARY INFORMATION

(Do **NOT** include as part of the Short-Form Sampling and Analysis Plan)

Section 2.5.1 **Field Quality Control Requirements (TtEMI START Region 5 QAPP)**

Table 2-2 **Tetra Tech Environmental SOPs (TtEMI START Region 5 QAPP)**

2.5.1 Field Quality Control Requirements

Field QC samples will be collected and analyzed to assess the quality of data generated from sampling activities. These samples may include trip blanks, field blanks, equipment rinsate blanks, field duplicates, field split samples, MS samples, MSD samples, and matrix duplicate samples. Field QC measurements may include field replicate measurements and checks of instrument responses against QC standards.

Trip blanks are used to assess the potential for sample contamination during handling, shipment, and storage. Trip blanks are sample bottles filled by the analytical laboratory with organic-free water. The trip blanks are sealed and transported to the field; kept with empty sample bottles and then with the investigative samples throughout the field effort; and returned to the laboratory for analysis with the investigative samples. Trip blanks are never opened in the field. One trip blank is usually included within every shipping cooler of liquid samples to be analyzed for VOCs.

Field blanks are samples of the same or similar matrix as the actual investigative samples that are exposed to the sampling environment or equipment at the time of sampling. They are used to assess contamination resulting from ambient conditions. Field blanks are required for liquid matrices. For aqueous samples, field blanks consist of analyte-free water such as degasified organic-free water for VOC analysis, HPLC water for SVOC analysis, and deionized or demineralized water for inorganic analyses. Field blanks are generally not required for solid matrices but may be collected on a case-by-case basis. Typically, one field blank is collected for every 10 or fewer liquid investigative samples.

Equipment rinsate blanks are collected when sampling equipment is used. These blanks assess the cleanliness of sampling equipment and the effectiveness of equipment decontamination. Equipment rinsate blanks are collected by pouring analyte-free water over surfaces of cleaned sampling equipment that contact sample media. Equipment rinsate blanks are collected after sampling equipment has been decontaminated but prior to being reused for sampling. Equipment rinsate blanks are typically collected for each type of decontaminated sampling equipment.

Field duplicate samples are independent samples collected as close as possible in space and time to the original investigative sample. Immediately following collection of the original sample, the field duplicate sample is collected using the same collection method. Care should be taken to collect the field duplicate sample as close to the location of the original sample as possible. Field duplicate samples can measure how sampling and field procedures influence the precision of an environmental measurement. They can also provide information on the heterogeneity of a sampling location. Typically, field duplicates are collected at a frequency of one for every 10 investigative samples of the same matrix type.

Field split samples are usually a set of two or more samples taken from a larger homogenized sample. The larger sample is usually collected from a single sampling location, but can also be a composite sample. Field split samples can be sent to two or more laboratories and are used to provide comparison data between the laboratories. Regulatory agencies involved in a project may request that field split samples be collected to monitor how closely laboratories are meeting project-specific QA objectives.

MS/MSD samples are typically collected for analysis by organic methods, and also often for analysis by inorganic methods. Solid MS/MSDs usually require no extra volume. Each liquid MS/MSD sample is a single sample, usually collected from a single sampling location at triple the normal sample volume. MS and matrix duplicate samples are typically collected for inorganic analysis. The MS sample and matrix duplicate sample are each a single sample, usually collected from a single location at double the normal sample volume. In the laboratory, MS/MSD samples and MS samples are spiked with known amounts of

analytes. Matrix duplicate samples are not spiked. Analytical results of MS/MSDs are used to measure the precision and accuracy of the laboratory organic (or inorganic) analytical program and MSs are used to measure the accuracy of the inorganic analytical program. Matrix duplicate samples are used to measure the precision of the inorganic analytical program. Each of these QC samples is typically collected and analyzed at a frequency of one for every 20 investigative samples per matrix.

QC checks for field measurements will consist primarily of initial and continuing calibration checks of field equipment. When applicable, QC check standards independent of the calibration standards will be used to check equipment performance. For example, when checking the accuracy of field equipment such as pH meters, a standard buffer solution independent of the calibration standards may be used. Precision of field measurements will usually be checked by taking replicate measurements. To the extent possible, Tetra Tech will use EPA-approved field methods. If approved methods are not available, Tetra Tech SOPs will be referenced in the project-specific QAPP. The types and frequencies of field QC measurements and the QC limits for these measurements will be specified in the project-specific QAPP.

TABLE 2-1

TETRA TECH ENVIRONMENTAL SOPs

SOP Number	SOP Title
073	Air Quality Monitoring
101	Anthrax Sampling
026	Borehole Logging
007	Bulk Material Sampling
091	Calculating Discharge Using a Parshall Flume
095	Calculation of Discharge Using a Marsh-McBirney Water Current Meter
090	Calculation of Discharge Using Price Type AA or Pygmy Current Meter
064	Calibration of Air Sampling Pump
065	Colorimetric Indicator Detectors (Dräeger Tubes)
008	Containerized Liquid, Sludge, and Slurry Sampling
061	Field Measurement of Groundwater pH, Specific Conductance, and Temperature Using the YSI Model 3560
012	Field Measurement of pH
013	Field Measurement of Specific Conductance
011	Field Measurement of Water Temperature
088	Field Measurement of Water Turbidity
002	General Equipment Decontamination
015	Groundwater Sample Collection Using Micropurge Technology
010	Groundwater Sampling
052	Measurement of Stream or Pond Stage
021	Monitoring Well Development
020	Monitoring Well Installation
077	Operation and Maintenance of Stevens Type F Recorders
003	Organic Vapor Air Monitoring
019	Packaging and Shipping Samples
024	Recording Notes in Field Logbooks
001	Site Reconnaissance and Characterization
006	Sludge and Sediment Sampling
074	Soil Gas Sampling Methods
005	Soil Sampling
025	Soil Sampling for Volatile Organic Compounds (In Preparation)
014	Static Water Level, Total Well Depth, and Immiscible Layer Measurement
093	Stream Flow Measurement Using a Crest-Stage Gauge
009	Surface Water Sampling
096	Using a Portable 90° V-Notch Weir and Calculating Discharge
054	Using the Geoprobe® System